A BUNCH OF INTERESTING QUESTIONS
with inequalities

1) Find the area of the regions formed by all the points whose coordinates satisfy all of the following conditions:

a) $\begin{cases} x > 0 \\ x - 2y < 7 \\ x + y < 4 \end{cases}$

b) $\begin{cases} -3 < x < 4 \\ y > 0 \\ 2x + y < 4 \end{cases}$

c) $\begin{cases} xy > 0 \\ x + y < 4 \\ x + y > -4 \end{cases}$

d) $\begin{cases} x > y \\ x + y < 2 \\ x^2 + y^2 < 4 \end{cases}$

e) $\begin{cases} |x + y| < 4 \\ |x| < 6 \end{cases}$

Homework:

1) Draw the regions formed by all the points whose coordinates satisfy all of the following conditions. Find the areas of the regions.

a) $\begin{cases} -4 < x < 2 \\ y < 0 \\ 2x + y > -8 \end{cases}$ b) $\begin{cases} x + y < 0 \\ |x| < 2 \\ |y| < 3 \end{cases}$ c) $\begin{cases} x > y \\ xy > 0 \\ x^2 + y^2 < 4 \end{cases}$ d) $|x| + |y| < 4$

2) (Super-challenge) Find the volume of the solid: $|x| + |y| + |z| < 4$

Answers homework: 1) a) 36 b) 12 c) π d) 32